CLAIMS

What is claimed is:

1.   A method for eliminating false voice detection in Voice Over Internet Protocol (VOIP) service supporting a voice band data mode and a voice mode, the method comprising:

in voice band data mode, enabling silence detection and disabling voice detection for a voice band signal associated with a VOIP call;

monitoring the voice band signal for silence;

in response to detecting silence for a predetermined length of time, enabling voice detection;

if voice detection is enabled, monitoring the voice band signal for voice; and

in response to detecting voice, terminating voice band data mode and entering voice mode.

2.   The method according to Claim 1 wherein, if the silence detected is shorter than the predetermined length of time, continuing in voice band data mode and disabling voice detection.

3.   The method according to Claim 1 wherein, if voice detection is enabled, in an absence of detecting voice, continuing in voice band data mode.

4.   The method according to Claim 1 wherein detecting silence includes terminating the voice band data mode if silence exceeds a second predetermined length of time.

5.   The method according to Claim 4 wherein the second predetermined length of time is at least two seconds.

6.   The method according to Claim 1 wherein detecting silence includes detecting silence in a bi-directional manner.

7.   The method according to Claim 6 wherein enabling voice detection occurs in response to detecting silence for at least about 250 msec.

8.   The method according to Claim 1 further including disabling echo cancellation in voice band data mode and enabling echo cancellation in voice mode.

9.   The method according to Claim 1 operating in a gateway.

10.   The method according to Claim 9 wherein the gateway is a terminating gateway.

11.   The method according to Claim 9 wherein the gateway is an originating gateway.

12.   The method according to Claim 1 operating external from a gateway.

13.   The method according to Claim 12 operating between the terminating gateway and an answering modem.

14.   An apparatus for eliminating false detection in a Voice Over Internet Protocol (VOIP) service supporting a voice band data mode and a voice mode, the apparatus comprising:

         a communications bus carrying voice band signals associated with a VOIP call;

         a silence detector coupled to the communications bus adapted to (i) detect silence on the bus and (ii) enable in voice band data mode;

         a voice detector coupled to the bus adapted to (i) detect voice on the bus, (ii) initially disable in voice band data mode, (iii) enable in response to the

silence detector's detecting silence for a predetermined length of time, and (iv) monitor the voice band signals after being enabled; and

    a processor, coupled to the silence detector and the voice detector, that terminates voice band data mode and enters voice mode in response to the voice detector's detecting voice on the communications bus.

15.   The apparatus according to Claim 14 wherein the processor continues in voice band data mode if the silence detector detects silence for less than the predetermined length of time.

16.   The apparatus according to Claim 14 wherein, if the voice detector is enabled, the processor disables the voice detector and continues in voice band data mode in an absence of an indication from the voice detector that voice is detected.

17.   The apparatus according to Claim 14 wherein, if the silence detector detects silence for a second predetermined length of time, the processor terminates the voice band data mode.

18.   The apparatus according to Claim 17 wherein the second predetermined length of time is at least two seconds.

19.   The apparatus according to Claim 14 wherein the silence detector detects silence on the communications bus in a bi-directional manner.

20.   The apparatus according to Claim 19 wherein the voice detector enables in response to the silence detector's detecting silence for at least two seconds.

21.   The apparatus according to Claim 14 further including an echo canceller disabled in voice band data mode and enabled in voice mode.

22. The apparatus according to Claim 14 deployed in a gateway.

23. The apparatus according to Claim 22 deployed in a terminating gateway.

5 24. The apparatus according to Claim 22 deployed in an originating gateway.

25. The apparatus according to Claim 14 deployed external from a gateway.

26. The apparatus according to Claim 25 deployed between the terminating gateway
10 and an answering modem.

27. A computer-readable medium having stored thereon sequences of instructions,
the sequences of instructions, when executed by a digital processor, cause the
processor to:
15 for a Voice Over Internet Protocol (VOIP) call, enable silence detection
and disable voice detection in voice band data mode;
monitor a voice band signal associated with the VOIP call for silence;
in response to detecting silence for a predetermined length of time,
enable voice detection;
20 if voice detection is enabled, monitor the voice band signal for voice;
and
in response to detecting voice, terminate voice band data mode
and enter voice mode.

25 28. The computer-readable medium according to Claim 27 wherein the sequences of
instructions cause the processor to continue in voice band data mode and disable
voice detection if the silence detected is shorter than the predetermined length of
time.

29.   The computer-readable medium according to Claim 27 further including instructions to cause the digital processor to continue in voice band data mode in an absence of detecting voice if voice detection is enabled.

5   30.   The computer-readable medium according to Claim 27 wherein the instructions that cause the processor to detect silence include instructions that cause the processor to terminate the voice band data mode if silence exceeds a second predetermined length of time.

10   31.   The computer-readable medium according to Claim 30 wherein the second predetermined length of time is at least two seconds.

32.   The computer-readable medium according to Claim 27 wherein the instructions that cause the processor to detect silence include instructions that cause the

15   processor to detect silence in a bi-directional manner.

33.   The computer-readable medium according to Claim 32 wherein the instructions that cause the processor to detect silence include instructions that enable voice detection in response to detecting silence for at least about 250 msec.

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34.   The computer-readable medium according to Claim 27 further including instructions that cause the processor to disable echo cancellation in voice band data mode and enable echo cancellation in voice mode.

25   35.   The computer-readable medium according to Claim 27 used in a gateway.

36.   The computer-readable medium according to Claim 35 wherein the gateway is a terminating gateway.

37.   The computer-readable medium according to Claim 35 wherein the gateway is an originating gateway.

38.   The computer-readable medium according to Claim 27 used in a network device external from a gateway.

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39.   The computer-readable medium according to Claim 38 wherein the network device external from a gateway operates between a terminating gateway and an answering modem.

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40.   An apparatus for eliminating false detection in a Voice Over Internet Protocol (VOIP) service supporting a voice band data mode and a voice mode, the apparatus comprising:

        means for enabling silence detection and disabling voice detection for a

15   VOIP call in voice band data mode;

        means for monitoring a voice band signal associated with the VOIP call for silence;

        means for enabling voice detection in response to detecting silence for a predetermined length of time;

20   means for monitoring the voice band signal for voice if voice detection is enabled; and

        means for terminating voice band data mode and entering voice mode in response to detecting voice.

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